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Biotoxins

Biotechnological and Therapeutic
Applications



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Chapter 5

Cyanotoxins: Industrial Potential



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Abstract Cyanotoxins are secondary metabolites produced by specific cyanobacterial species, able to grow and bloom in all aquatic and terrestrial biotas. The rationale for cyanotoxin production is still a mystery. There are many records of the adverse impacts of cyanotoxins, harming the organisms, animals, plants, and humans. However, with the continuous global research on these complex biological toxins, scientists realize their potency in industry, which benefits humans. The pharmaceutical industry is always looking for novel drugs from natural sources as most current medications cause adverse side effects, and most drugs/antibiotics have become ineffective because of the resistant nature of the infective microbes. Hence, cyanotoxins are an excellent source to be targeted. This chapter begins with an introduction to cyanobacteria, followed by a description of the diverse cyanobacterial toxins and their chemical structures. The next section will be on their bioactivity and genomics. The following section discusses the potential biomedical applications of various cyanotoxins, such as microcystins, oscillatoxins, anatoxins, and kalkitoxins, including those currently being tested and as future targets for different diseases. The following section discusses the utility of cyanotoxins in other industrial applications, including the production of algacides, herbicides, and insecticides. The final section will include the conclusions and prospects as these cyanotoxins still need to be fully explored.

Keywords Biomedical applications of cyanotoxins · Cyanotoxin chemical structures · Cyanotoxins and cytotoxic compounds · Cylindrospermopsin · Microcystins · Nodularin · Saxitoxin

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